

## A NEW SPECIES OF COLUBRID SNAKE OF THE GENUS *CONIOPHANES* FROM THE HIGHLANDS OF CHIAPAS, MEXICO

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*Abstract.*—A new species of colubrid snake, *Coniophanes alvarezi*, is described from the Meseta Central of Chiapas, Mexico. This snake inhabits temperate mesic pine-oak forest at elevations of 2012 to 2134 m. Unlike *C. alvarezi*, most other members of this genus have essentially lowland, tropical distributions. *Coniophanes alvarezi* is easily distinguished from its congeners by its uniformly brown dorsal coloration in adults (weakly striped in juveniles), immaculate venter, and features of lepidosis and dentition. This species appears to be most closely related to the wide-ranging *C. fissidens*, and a detailed comparison of these two species is presented.

Over 15 years have now passed since I first discovered an unusual colubrid snake of the genus *Coniophanes* near Teopisca in Chiapas, Mexico. On subsequent trips through the region (in 1976 and 1983) additional material representing this taxon was collected, including three eggs that were allowed to hatch. In all, a total of seven specimens are now available. I propose that this snake, apparently endemic to the Mexican state of Chiapas, be known as:

*Coniophanes alvarezi*, new species  
Figs. 1–3

*Holotype.*—The University of Texas at Arlington (UTA) R-12256 (original field number, JAC 9389), an adult male from 11.3 km ESE Teopisca, 2073 m elevation, Chiapas, Mexico, collected by J. A. Campbell on 7 Aug 1983.

*Paratypes.*—Six specimens, all from Chiapas, Mexico: UTA R-2793, an adult female from 12.1 km ESE Teopisca, 2134 m elevation, collected 14 Aug 1973; UTA R-5766-67, adult females from 10.3 km ESE Teopisca, 2012 m elevation, collected 16 Jun 1976; and UTA R-6111-13, two neonate males and a female, respectively, from

10.3 km ESE Teopisca, 2012 m elevation, that hatched on 18 Aug 1976 from eggs discovered beneath a log on 29 May 1976.

*Diagnosis.*—A relatively large species of *Coniophanes* in which females are known to reach 521 mm in total length; dorsal scales disposed in 19-19-17 rows; adults differing from all congeners in having a uniformly brown dorsal coloration and immaculate yellow venter (except for a few tiny black stippling anteriorly). All other members of the genus have at least traces of longitudinal body striping, except *C. lateritus* and some specimens of *C. meridianus*, both of which have an orange or red dorsal coloration and a black head or collar.

*Description of holotype.*—An adult male, 375 mm in total length; tail length 93 mm (24.8% of total); head length 14.9 mm from front face of rostral to posterior end of mandible; head width 8.5 mm at broadest point (level of angle of mouth); head moderately distinct from neck; snout acutely rounded in dorsal view; snout 2.3 times as long as horizontal distance across eye; pupil round; rostral about 1.7 times broader than high; head scutellation of generalized colubrid type; internasals 1.4 times wider than long, laterally contacting anterior and posterior



Fig. 1. Dorsal aspect of *Coniophanes alvarezi*, holotype, UTA R-12256, 375 mm TL.

nasals; prefrontals large, slightly longer than wide, laterally contacting posterior nasal and loreal, forming upper anterior margin of orbit; median prefrontal suture about half as long as frontal; frontal 1.6 times longer than wide; parietals about 1.6 times longer than wide, median suture slightly less than frontal length; nostrils located in central posterior portion of anterior nasals; loreal about half of combined length of nasals; two postoculars; temporals 1 + 2, separating supralabials 6 and 7 from parietal; supralabials 7/7, 1st contacting nasals and loreal, 2nd contacting loreal and preocular, 3rd contacting preocular and orbit, 4th contacting orbit and lower postocular, 5th contacting lower postocular and anterior temporal, 6th contacting primary and lower secondary temporals, 7th contacting lower secondary temporal; mental two times broader than long, separated from chinshields by first pair of infralabials which contact each other along the midline; anterior chinshields well developed, about twice as long as wide; pos-

terior chinshields well differentiated from gulars, separated from 1st ventral by two gulars plus two preventrals; infralabials 9/9, 1–4 contacting anterior chinshields, 4th largest; dorsal scales disposed in 19 smooth rows, reduced to 17 posteriorly; dorsal scales in six rows at level of 10th subcaudal; no apical pits; ventrals 134; supra-anal tubercles (keels) present; anal divided; subcaudals 64, paired.

In life, dorsal ground color uniformly brown; venter immaculate pale yellow, except on the anterior third of the body where a small amount of fine black peppering present, especially on head and gular region; a black line running across upper portion of rostral and extending posteriorly just below eye to angle of mouth, thence posteriorly for two or three scales, bordered ventrally by white; supralabials mostly white, heavily speckled with black; iris copper-colored, with heavy suffusion of black ventrally.

In preservative (alcohol after formalin) ground color of dorsum brown, except where



Fig. 2. Ventral aspect of *Coniophanes alvarezi*, holotype.

the stratum corneum sloughed off, where it is gray; venter creamy white.

Everted hemipenis five subcaudals in length; organ simple with sulcus spermaticus bifurcating at about level of subcaudal 3, but extending distally on capitulum for a length less than half of everted capitulum; asulcate, basal portion of organ possesses three large basal hooks, distal to which are some 7–9 large spines; sulcate side of organ also bears some 13–15 spines, but these are considerably smaller than those on the asulcate side; organ distinctly capitate; margin of capitulum covered with spinulate calyces, toward apex calyces become papillate; capitulum extends proximally almost half the length of organ on sulcate side; on asulcate side a pair of naked grooves extend distally from several large spines almost to apex (i.e., to overhang of the capitulum).

*Variation.*—The paratypic series is composed of two males and four females. The holotype is the largest male; the largest fe-

male has a total length of 521 mm, and a tail length of 111 mm (21.3% of total). Three juveniles, preserved on the date of hatching, were 154–162 mm in total length, with tail lengths of 34–38 mm (21.7–24.7% of total). Only one snake in the type series, an adult female, has an incomplete tail. The supralabials are invariably 7/7; the infralabials are 9/10 in one specimen, 9/9 in all others. The number of dorsal scale rows is 19–19–17 in all but one specimen which has 16 rows posteriorly. There are 134–136 and 140–143 ventrals, and 59–64 and 54–57 subcaudals, in males and females, respectively. The top of the head in the juveniles (UTA R-6111-13) is dark brown and contrasts with the pale brown of the dorsum. Juveniles have a faint middorsal stripe, darker than the ground color, involving only the vertebral scale row, extending the length of the body and tail, and have almost indistinguishable indications of a dark lateral stripe on scale row 4.



Fig. 3. Lateral aspect of *Coniophanes alvarezi* showing details of head pattern.

**Etymology.**—The name *alvarezi* is a patronym in honor of Miguel Alvarez del Toro, Director of the Instituto de Historia Natural of Chiapas. His noble love for the flora and fauna of southern Mexico has led to a better understanding of the natural history of Chiapan wildlife and forests and to the first significant conservation efforts taken in this state.

**Distribution.**—This species is known only from the Meseta Central of Chiapas at 2012 to 2134 m elevation. These highlands are covered by a temperate mesic pine-oak forest with abundant epiphytes. All specimens of *Coniophanes alvarezi* were taken under rocks or logs at the edges of clearings.

**Comparison with *Coniophanes fissidens*.**—Owing to characters of lepidosis, color pattern, hemipenes, and dentition, *Coniophanes alvarezi* appears to be most closely related to *C. fissidens*. The geographical distribution of *C. alvarezi* is more closely approached by that of *C. fissidens* than by

any other species of *Coniophanes*. A comparison of selected features between *C. alvarezi* and *C. fissidens* is presented in Table 1.

Throughout most of its range *C. fissidens* usually has 21 dorsal scale rows at midbody (Bailey 1939, Minton & Smith 1960, Smith 1941). However, several isolated populations of *C. fissidens* in the northern part of the range have a modal number of 19 dorsal scale rows at midbody. The populations of *C. fissidens* inhabiting eastern San Luis Potosí and west-central Veracruz, described as *C. f. proterops* (Smith, 1941) and *C. f. convergens* (Shannon & Smith, 1949), resemble *C. alvarezi* in usually having 19 midbody dorsal scale rows and 7 supralabials. These snakes also have a relatively high number of ventrals for the species (males, 121–133; females, 126–133) and low number of subcaudals (males, 63–80; females, 59–74) (Smith 1941; Smith & Laufe 1945; Taylor 1949, 1953), but the counts do not overlap

the range of variation known for *C. alvarezi*. The pattern of longitudinal body striping is relatively subdued, but always present, at least posteriorly, in adults (Smith 1941; Taylor 1949, 1953), and is distinct in juveniles and subadults (Smith 1941). *Coniophanes f. proterops* was reported from high elevations of the Atlantic versant of Chiapas by Smith & Williams (1963) on the basis of three specimens from two localities, 13 miles east of Las Rosas and Monserrat. I have not re-examined these specimens, housed in the University of Illinois Museum of Natural History, but the description provided by these authors is similar in some respects to *C. alvarezi*, although the ventral and subcaudal counts suggest they may be all males rather than females as stated.

Specimens of *C. fissidens* from the Pacific slopes of Michoacán and Guerrero, described as *C. f. dispersus* (Smith, 1941), also have 19 midbody scale rows (Bailey 1939, Davis & Dixon 1959, Peters 1954, Smith 1941), but in most other respects of lepidosis and pattern do not closely resemble *C. alvarezi*.

Along the Atlantic versant of Middle America, *Coniophanes fissidens* occurs in well drained mesic forests from eastern San Luis Potosí and west-central Veracruz (Mexico) eastward across east-central Belize and northern Guatemala through Honduras, Nicaragua, Costa Rica, and Panama (Alvarez del Toro 1983, Henderson & Hoevers 1975, Lee 1980, Minton & Smith 1960, Myers 1969, Schmidt 1941, Shreve 1957, Stuart 1963, Wilson & Meyer 1985, Zug et al. 1979), but it is absent from most of the Yucatán Peninsula. *Coniophanes fissidens* also occurs along the Pacific versant from Michoacán and Guerrero (Mexico) eastward through Central America to Ecuador (Bailey 1939, Myers 1969, Peters 1954, Peters & Orejas-Miranda 1970, Smith & Taylor 1945, Zug et al. 1979). On the Pacific slopes this species has been reported from up to 1463 m in Mexico (Landy et al. 1966) and 1432 m in Guatemala (Campbell

& Vannini 1988). I have taken two specimens of this species (UTA R-16015, 20744) on the Atlantic side of Guatemala in cloud forest at elevations of 1500–1600 m. The range of *C. fissidens* surrounds the highlands of the Meseta Central of Chiapas, but in no place is this species known to be sympatric with *C. alvarezi* or to attain similar elevations.

In a sample of 71 specimens of *C. fissidens* from southern Mexico and Guatemala (62 of Pacific slope origin, 9 from the Atlantic versant; Appendix), a number of salient differences are apparent between this species and *C. alvarezi* (Table 1). *Coniophanes alvarezi* differs from populations of *C. fissidens* in southern Mexico and Guatemala in having 19 midbody dorsal scale rows (vs. usually 21 in *C. fissidens*); 7 supralabials (vs. usually 8–9); usually 9 infralabials (vs. 10–11); 134–136 and 140–143 ventrals in males and females, respectively (vs. 114–124 and 119–131, respectively); 59–64 and 54–57 subcaudals in males and females, respectively (vs. 67–86 and 59–86, respectively); a uniformly brown or brownish olive dorsum in adults (vs. dark lateral and usually middorsal stripes); an essentially immaculate yellow venter (vs. a white or cream colored venter, heavily marked with dark spots, speckling, or mottling); and a relatively short tail that accounts for 22.8–24.8% and 20.9–21.7% of the total length in males and females, respectively (vs. 29.3–35.4% and 25.5–33.8%, respectively).

*Coniophanes fissidens* from the Atlantic versant of southern Mexico and Guatemala often possess large prominent dark spots on the lateral edges of the ventrals; the venter of snakes from Pacific Chiapas and Guatemala is heavily striped or flecked with black anteriorly, less so posteriorly.

The vague dark stripes in juvenile *C. alvarezi* are not positioned the same as in *C. fissidens*, but may have been derived from the pattern evident in the latter species. The color pattern in juvenile *C. alvarezi* consists of a poorly indicated dark strip confined to

Table 1.—Comparison of *Coniophanes alvarezi* and *C. fissidens* from southern Mexico and Guatemala for selected features of lepidosis, color pattern, and proportion. These data are based on specimens examined (see Appendix).

	<i>Coniophanes alvarezi</i>	<i>Coniophanes fissidens</i>
Dorsal scale rows	19–19–17(16) <sup>1</sup>	21(19)–21(19)–17(15) <sup>2</sup>
Supralabials	7 (100)%	7 (0.7%) 8 (97.9%) 9 (1.4%)
Infralabials	9 (93.0%) 10 (7.0%)	9 (12.7%) 10 (86.6%) 11 (0.7%)
Ventrals (males) (females)	134–136 ( $\bar{x} = 135.3$ ) 140–143 ( $\bar{x} = 141.3$ )	114–124 ( $\bar{x} = 119.2$ ) 119–131 ( $\bar{x} = 124.7$ )
Subcaudals (males) (females)	59–64 ( $\bar{x} = 62.3$ ) 54–57 ( $\bar{x} = 55.7$ )	67–86 ( $\bar{x} = 77.5$ ) 59–86 ( $\bar{x} = 73.0$ )
Adult dorsal color pattern	Uniformly brown or brownish olive	With distinct dark lateral stripes; often with dark dorsal stripe
Ventral color pattern	Immaculate yellow, except for a few dark flecks in gular region	Usually white or cream, with dark spots or mottling on lateral portion of ventrals
Tail/total length (males) (females)	22.8–24.8% ( $\bar{x} = 24.1\%$ ) 20.9–21.7% ( $\bar{x} = 21.3\%$ )	29.3–35.4% ( $\bar{x} = 33.1\%$ ) 25.5–33.8% ( $\bar{x} = 30.9\%$ )

<sup>1</sup> The dorsal scale rows are reduced posteriorly to 16 in one paratype (UTA R-2793).

<sup>2</sup> In 5 of 62 specimens examined from the Pacific versant of Guatemala and southern Mexico, the number of dorsal scale rows is reduced to 19 anteriorly and/or at midbody; one of nine specimens from the Atlantic slopes of southern Mexico and Guatemala has 19 dorsal scale rows at midbody. Only one specimen (UTA R-20711) from a large series collected at Finca El Faro, Quezaltenango, Guatemala, has 15 dorsal scale rows posteriorly.

the vertebral scale row and extremely faint darker lateral stripes on scale row 4. The dark coloration on the dorsum of *C. fissidens* extends over 3 to 7 dorsal scale rows, including the vertebral row, and the lateral stripes are broad, extending from scale rows 1 to 5, with particularly dark pigment on the upper portion of scale row 4 and the lower portion of scale row 5.

The hemipenes of *Coniophanes fissidens* differ from those of *C. alvarezi* in that on the asulcate side of the organ the distal most spines are nearly as large or larger than the basal hooks, and in that there is no pair of naked grooves.

In a paratype of *C. alvarezi* (UTA R-5767) the right maxillary bone bears 9 teeth (counting sockets), followed by a broad diastema and two enlarged fangs with deep anterolateral grooves extending four-fifths of their length. The right palatine and pter-

ygoid bones have 7 and 21 teeth, respectively. Examination of the dentition and associated bones of ten specimens of *C. fissidens* from Quezaltenango (Guatemala), only some 150 km from the type locality of *C. alvarezi*, reveals a number of differences. In comparison with *C. fissidens*, the teeth are relatively shorter, stouter, and not so strongly recurved; the choanal process of the palatine and the ectopterygoid process of the maxilla are more broadly expanded; and the ectopterygoid is more robust in *C. alvarezi*. There are 13–14 maxillary teeth (including the enlarged posterior teeth), 9–11 palatal teeth, and usually more than 21 pterygoid teeth in *C. fissidens*. The two posterior maxillary teeth of *C. fissidens* have strikingly different grooves from *C. alvarezi*. In *C. fissidens* the groove is very wide at the base of the tooth and tapers distally; in *C. alvarezi* the groove is no wider proximally

than distally. Further, the tips of the rear maxillary teeth in *C. fissidens* become distinctly compressed and bladelike, whereas in *C. alvarezi* the tips of these teeth are only slightly modified.

*Comparisons with other species of Coniophanes.*—Other than *C. alvarezi*, only two species of *Coniophanes* may lack any trace of longitudinal body striping. *Coniophanes lateritus* occurs in the Pacific Mexican lowlands and foothills from Sinaloa (Hardy & McDiarmid 1969) to Oaxaca (Smith & Taylor 1945). This species has a black head or collar and a red dorsum, often becoming dark posteriorly (Hardy & McDiarmid 1969, Smith & Grant 1958). *Coniophanes lateritus* further differs from *C. alvarezi* in having usually more ventrals (140–146) and subcaudals (84–99). *Coniophanes meridanus* has a uniclor reddish dorsum, pale temporal stripes, an incomplete black collar, often a trace of a middorsal stripe, and a bifurcate spineless hemipenis that extends 11 subcaudals (Bailey 1939). Pale temporal stripes are present in *C. imperialis*, *C. piceivittis*, and *C. schmidti*, and the latter two species have a broad dorsal black band. A double row of conspicuous black spots is present on the ventrals of *C. bipunctatus* and *C. quinquevittatus*. *Coniophanes bipunctatus*, *C. piceivittus*, *C. quinquevittatus*, and *C. schmidti* usually have 21 or more dorsal scale rows at midbody, *C. meridanus* and *C. joanae* have 17. The number of ventrals is higher in *C. piceivittus* (153–174), *C. quinquevittatus* (152–163), and *C. schmidti* (158–175), and lower in *C. joanae* (131–132). *Coniophanes alvarezi* has fewer subcaudals (54–64) than any congener except *C. joanae* ( $47 \pm 53$ ) and, very rarely, specimens of *C. imperialis* (62–94) and *C. quinquevittatus* (63–70). *Coniophanes dromiciformis* is a striped South American species and is not considered here.

The only other named species of *Coniophanes* with an essentially upland distribution is *C. joanae*, known from mesic

montane forests in Panama east of the canal at elevations of 500–1440 m (Myers 1966, 1969). This species differs from *C. alvarezi* in having a brown venter and supralabials, longitudinal body striping, and 17 dorsal scale rows at midbody. *Coniophanes bipunctatus*, *C. imperialis*, *C. meridanus*, *C. quinquevittatus*, and *C. schmidti* are restricted to lowland habitats and their range includes the northern portion of the Yucatán Peninsula (Duellman 1965, Lee 1980, McCoy 1969, Smith 1960). At least two of these species, *C. bipunctatus* and *C. quinquevittatus*, are semiaquatic and found in swampy or coastal lagoon habitats (Conant 1965, McCoy 1969, Myers 1969).

### Resumen

Se describe una nueva especie de colúbrido, *Coniophanes alvarezi*, de la Meseta Central de Chiapas, México. Esta especie de culebra ocurre en los bosques húmedos de pino y encino a elevaciones de 2012 a 2134 msnm. Al contrario de *C. alvarezi*, los otros miembros del género tienen rangos tropicales en tierras bajas. Se distingue fácilmente *C. alvarezi* de sus congéneres por su coloración, color dorsal uniforme, vientre sin manchas, y características de escamación y dentición. Parece que esta especie está relacionada con *C. fissidens* que tiene un rango muy extensivo, y se presenta una comparación detallada de estas dos especies.

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and *Imantodes cenchoa*.—Smithsonian Contributions to Zoology 300:1-20.

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### Appendix

*Specimens of Coniophanes fissidens examined.*—All are in the University of Texas at Arlington Collection of Vertebrates.

Guatemala: Baja Verapaz; vicinity of La Unión Barrios, 1500-1600 m (UTA R-16015, 20744); Escuintla: S slope Volcán

de Agua, Finca Rosario Vista Hermosa (UTA R-4468, 16016, 20691); Izabal: 5.1 km WSW Puerto Santo Tomás, 152 m (UTA R-20684); 7.0 km SW Puerto Santo Tomás, 400 m (UTA R-20685); Quezaltenango: S slope Volcán Santa María, ca. 4.0 km N El Palmar, 875 m (UTA R-20692-743); Finca El Carmen (UTA R-20686-90).

Mexico: Oaxaca; Cerro Baúl, 19 km NW Rizo de Oro (UTA R-12257); 2-3 mi S Tapantepec (UTA R-4337, 4339); Veracruz; 2.1 mi NW Sontecomapan (UTA R-3069); 7.7 mi NW Sontecomapan (UTA R-9457, 9468); 5.6 mi ESE Tebanca (UTA R-3067).